UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

DATE: March 1, 2012

SUBJECT: Comments on draft LVR BERA Weight of Evidence and Summary & Conclusions, 3 February 2012

FROM: James Chapman, Ph.D., Ecologist

TO: Demaree Collier, RPM

4.1.7.1 Chemical-Specific Analysis

The overall point that bioavailability is likely lower in weathered sediments at the site compared to bioavailability in non-smelter affected sediments elsewhere appears valid, but the statement that " predicting risks to ecological receptors based solely on exceedances of ESVs, which assume 100% bioavailability, almost certainly over-predicts the actual potential for adverse ecological effects" is inaccurate. The sediment TECs and PECs are derived from empirical studies of field sediments. The thresholds therefore reflect the distribution of bioavailabilities across the sites included in the sediment effects database, certainly not "100% bioavailability".

4.1.7.2 Upper Trophic Level Receptors

What is the basis for stating that mink and kingfisher "both have low body weights relative to their ingestion rates"? Neither species have unusual physiologies. According to Table RA-G4-4 of the 2010 draft RI, mink food ingestion rate is derived through a generic allometric equation for mammals in Nagy (2001). How then can mink be characterized as having low bodyweight relative to ingestion rate when the food ingestion rate is one for *any* mammal with that bodyweight? Table RA-G4-4 omits the source of the kingfisher food ingestion rate.

What is the meaning of "marginal toxicity"? The geomean approach used for deriving LOAEL TRVs results in an estimate of an *average* lowest observed adverse effect level. On this basis, when a HQ equals 1, the receptor is expected to show, on average, an adverse effect.

The basis for the mink area use factor was questioned earlier, which may affect the mink risk findings. Is it accurate to state for mink that the FCM "assume that the investigated species foraged exclusively at the Site"? The 2010 draft BERA showed a mink AUF of 0.4.

The statement that "the FCMs assume that the investigated species … consume more mussels than Site sampling suggest are available" is misleading. Kingfisher do not eat mussels, the invertebrate portion of the kingfisher diet includes "insects, crustacea, and crayfish" (2010 draft RI Table RA-G4-4). The use of mussel bodyburden data in the kingfisher model is not as a plausible prey item, but as a surrogate for accumulation in insect and crayfish prey.

Similarly for mink, although reported as one of the predators of mussels (Cummings and Mayer (1992), the mink invertebrate dietary composition selected in the draft BERA includes "crustacea and crayfish" (2010 draft RI Table RA-G4-4), not mussels. Again, the role of mussel uptake data in the mink model is as a surrogate for crayfish prey.

4.1.7.3 Benthic Receptors

Another potential, but unverified, explanation for possible limited but inconsistent effects could be sporadic inclusion of recently eroded unweathered slag material in the tested samples. The sediment chemical analysis provided data on total metal concentrations. Bioavailability might have varied among units in relation to relative proportions of recently deposited and well-weathered sediments.

Literature Cited

Cummings, K.S. and C.A. Mayer. 1992. Field Guide to Freshwater Mussels of the Midwest. Illinois Natural History Survey Manual 5. Champaign, IL. 194 p.